

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-024746

(43)Date of publication of application : 30.01.1996

(51)Int.Cl.

B05C 5/00  
B05B 7/04  
B05C 17/005

(21)Application number : 06-185246

(71)Applicant : HONDA MOTOR CO LTD

(22)Date of filing : 14.07.1994

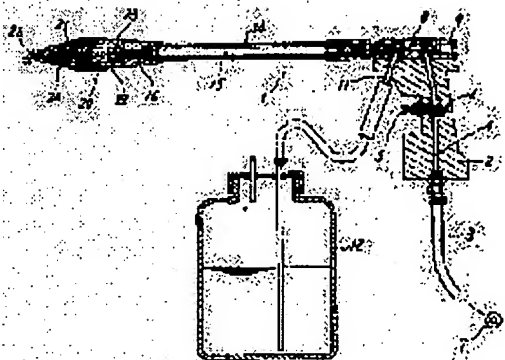
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## (54) FOAMING COATING APPARATUS

### (57)Abstract:

**PURPOSE:** To uniformly apply an antifriction liquid on a surface to be coated.

**CONSTITUTION:** A liquid supply pipe 11 communicated with a soapy water storage tank 12 is connected to an air feed pipe 8 of compressed air which is turned on and off by a manually operated valve 5 provided on a grip 2, and soapy water is allowed to flow into a foaming nozzle 20 together with the compressed air by Venturi effect and while the pressure and speed of the compressed air are reduced in two rooms 22, 24 provided in the inside, these are uniformly mixed to make a dense bubble state and be applied on a surface to be coated from a discharge port 25.



## LEGAL STATUS

[Date of request for examination] 04.07.2001

[Date of sending the examiner's decision of rejection] 22.12.2004

[Kind of final disposal of application other than the examiner's decision of rejection or

application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's  
decision of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平8-24746

(43) 公開日 平成8年(1996)1月30日

(51) Int.Cl. <sup>8</sup>	識別記号	序内整理番号	F I	技術表示箇所
B 0 5 C 5/00	Z			
B 0 5 B 7/04		8927-4F		
B 0 5 C 17/005				

審査請求 未請求 請求項の数1 F D (全 4 頁)

(21) 出願番号 特願平6-185246

(22) 出願日 平成6年(1994)7月14日

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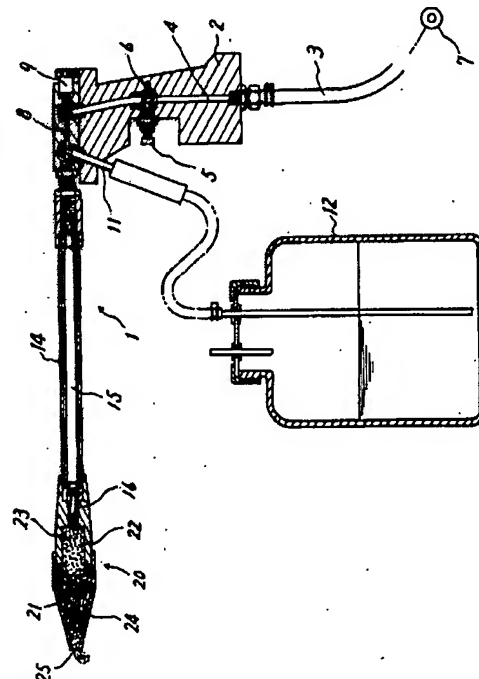
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(54) 【発明の名称】 泡立て塗布装置

(57) 【要約】

【目的】 減摩液を被塗物面に均一に塗布すること。

【構成】 グリップ2に設けた手動弁5によって開閉操作される圧縮空気の送気管8に石鹸水収納タンク12に連通する給液管11を接続させ、ベンチュリー効果によって石鹸水を圧縮空気とともに泡立てノズル20内に流入させて、その内部に設けた2つの室22、24内で圧力と速度を低下させながら、これらを均一に混合し、緻密な泡状となして吐出口25から被塗物面に塗布するようにしたもの。



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## 【特許請求の範囲】

【請求項1】 一端が圧縮空気供給源に連通し、かつグリップ部に配設した手動弁により開閉操作される送気管と、一端が減摩液収納部に連通し、他端が上記送気管の縮流部に連通した給液管と、一端が上記送気管の他端に連通し、かつ内部に設けた縮流部を境として上流側に多孔質材を充填した膨張室を形成し、下流側に吐出口を設けた膨張室を形成してなる泡立てノズルと、からなる泡立て塗布装置。

## 【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は減摩液を泡立てて被塗物面に塗布する塗布装置に関する。

【0002】

【従来の技術】タイヤの装着など、一般に鋼材からなる部材にゴム等の弾性部材を嵌め合すには、弾性部材を装着する部分に石鹸水等の減摩液をはけで塗布するか、あるいは霧吹で吹付けるかして、その部分の摩擦を減らすような手法が採られるが、これまでは、この塗布量を均一にできないため、必要以上の減摩液を塗布してしまうことになって、無駄が多いばかりでなく効率のより作業を行い得ないといった問題を有していた。

【0003】

【発明が解決しようとする課題】本発明はこのような問題に鑑みてなされたもので、その目的とするところは、泡状にした減摩液を被塗物面に効率よく適量塗布することのできる新たな泡立て塗布装置を提供することにある。

【0004】

【課題を解決するための手段】すなわち、本発明はこのような課題を達成するための泡立て塗布装置として、一端が圧縮空気供給源に連通し、かつグリップ部に配設した手動弁により開閉操作される送気管と、一端が減摩液収納部に連通し、他端が送気管の縮流部に連通した給液管と、一端が送気管の他端に連通し、かつ内部に設けた縮流部を境として上流側に多孔質材を充填した膨張室を形成し、下流側に吐出口を設けた膨張室を形成してなる泡立てノズルとによって構成したものである。

【0005】

【作用】このように構成したことにより、ベンチュリー効果によって引き込んだ減摩液を圧縮空気とともに泡立てノズル内に送り込み、この内部に設けた2つの膨張室内で緻密な泡となして被塗面に吐出するようにする。

【0006】

【実施例】そこで以下に図示した実施例について説明する。図1、図2は本発明の一実施例を示したもので、図中符号1で示した塗布装置本体1は、基端部にグリップ2を先端部に泡立て塗布ノズル20を備えたガンタイプのもので構成され、グリップ側で導入した減摩液つまり石鹸水と圧縮空気を先端部の泡立てノズル20の

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内部で緻密な泡状にした上、被塗物面に塗布するように構成されている。

【0007】これをさらに詳しく説明すると、塗布装置本体1のグリップ2には、下端を圧縮空気供給管3の接続部となした通気導孔4が上向に設けられ、この通気導孔4の途中には、指によって操作される手動弁5がコイルスプリング6により常時通気導孔4を閉塞するように付勢された状態で取付けられている。

【0008】一方、図中符号8はグリップ2の上部に横設した送気管で、この送気管8の始端部には流量調整弁9が螺合されていて、ここには、上記した通気導孔4が連通し、またこの下流側には、図示しない逆止弁を内蔵した石鹸水供給管11が連通していて、石鹸水収納タンク12内の石鹸水をベンチュリー効果により送気管8内に吸い上げることができるよう構成されている。

【0009】この送気管8は、グリップ2の前方で金属バント14を巻回したビニール製の送気管15と結合して可撓性が付与され、さらにその先端には上記した泡立てノズル20が結合されている。

【0010】他方、この泡立てノズル20は、図に見られるように砲弾型をなして、送気管15の先端にノズル16を介して取付けられ、ここに送り込まれてきた石鹸水と圧縮空気を均一に攪拌して泡状にした上で、先端の吐出口25から被塗面上に吐出するように構成されている。

【0011】すなわち、この泡立てノズル20には、その内部のオリフィス部21を境として上流側に小室22が、下流側に大室24が形成され、さらに、小室22内にはスポンジ等の多孔質材23が充填され、また大室24の先端には吐出口25が形成されて、これらの室22、24内で緻密な泡状となした石鹸水を吐出口25から被塗物面上に吐出させるように構成されている。

【0012】このように構成された実施例において、いま、作業者が被塗物の弾性部材装着面に石鹸水を塗布すべくグリップ2を握った方の指でバルブ5を押圧操作すると、圧縮空気供給源7からグリップ2の通気導孔4を経て送気管8内に流入した圧縮空気は、ここで、ベンチュリー効果によって石鹸水収納タンク12内の石鹸水を吸引しつつ、泡立てノズル20内へ流下する。

【0013】そしてつぎに、この圧縮空気と石鹸水が狭いノズル21から断面面積の大なる小室22内に流入すると、これらはラビリンス効果により小室22内で乱流を起こし、急激に圧力と速度を低下させて多孔質材23内に流入し、さらにオリフィス部21で絞り込まれた上、再び断面面積の大きな大室24内に流入し、ここで再び圧力と流速を減少させつつ均一に混合し、緻密な泡状流体となって吐出口25から吐出して、被塗物の弾性部材装着面に等しく塗布される。

【0014】

【発明の効果】以上述べたように本発明によれば、グリ

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ップ部に設けた手動弁によって開閉操作される圧縮空気の送気管に、減摩液収納部と連通した給液管を接続するとともに、この送気管の先端に、内部に設けた縮流部を境として上流側に多孔質材を充填した膨張室を、下流側に吐出口を設けた膨張室を区画してなる泡立てノズルを接続して泡立て塗布装置を構成するようにしたので、ベンチュリー効果によって石鹸水を引き込んだ圧縮空気を、はじめに、上流側の膨張室内で圧力と速度を下げてこれらを多孔質材の中で均一に混合し、ついで、下流側の膨張室内でさらに圧力と速度を低下させながら緻密な泡状にした上で、吐出口から緩やかに吐出させることができ、これらを被塗物面に均一に塗布することを可能となして、弾性部材の嵌め合い部分に必要最小限の減摩液を付着させることにより十分な低摩擦面の形成を容易にかつ効率よく行わせることができる。

【図面の簡単な説明】

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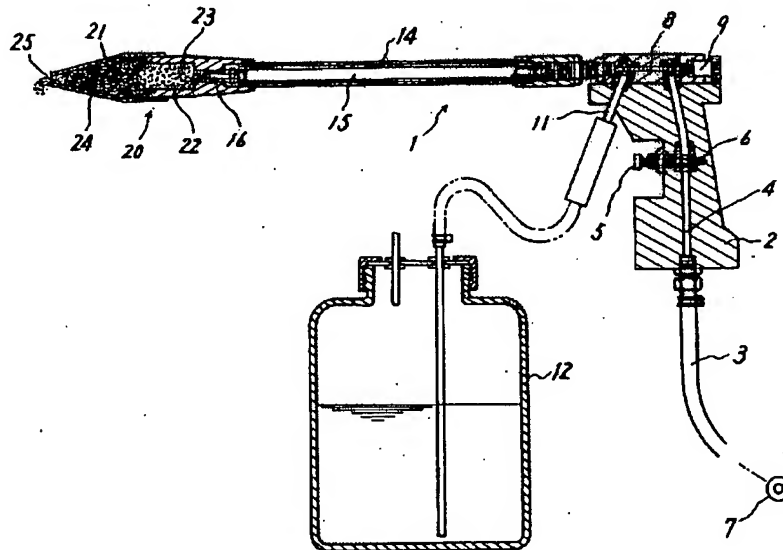
【図1】本発明の一実施例をなす装置を断面で示した側面図である。

【図2】図上装置の斜視図である。

【符号の説明】

- 2 グリップ
- 3 圧縮空気供給管
- 5 手動弁
- 8 送気管
- 10 給液管
- 12 石鹸水収納タンク
- 20 泡立てノズル
- 22 小室
- 23 多孔質材
- 24 大室
- 25 吐出口

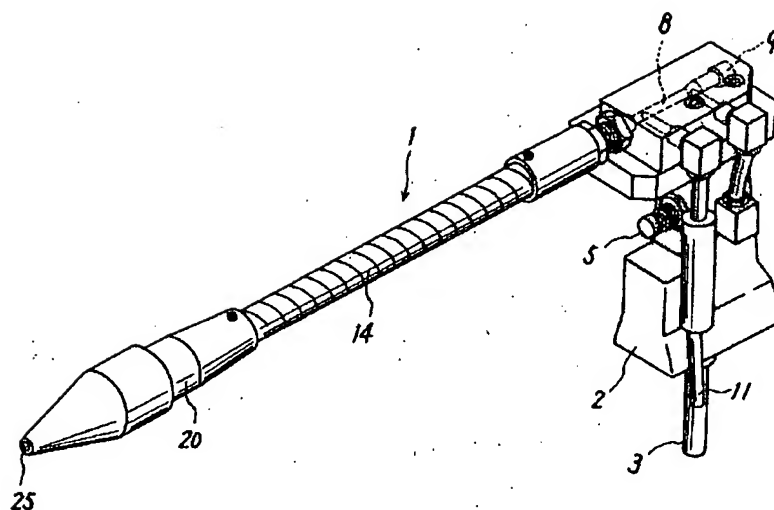
【図1】



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【図2】



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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention should foam lubrication liquid -- it is related with the coater applied to \*\*\*\*\*.

[0002]

[Description of the Prior Art] Although the technique that friction of the part is reduced by applying lubrication liquid, such as soapy water, to the part equipped with an elastic member with the brush, or spraying with a sprayer is taken in order for wearing of a tire etc. to insert elastic members, such as rubber, in the member which generally consists of steel materials Until now, since this coverage was not made to homogeneity, the lubrication liquid beyond the need will be applied and it had the problem there is not only much futility, but that could not work from that of effectiveness.

[0003]

[Problem(s) to be Solved by the Invention] this invention was made in view of such a problem, and the place made into the purpose can carry out optimum dose spreading of the lubrication liquid made into the shape of a bubble efficiently to a coated object side -- new -- foam -- it is in offering a coater.

[0004]

[Means for Solving the Problem] that is, foam for this invention to attain such a technical problem -- as a coater The airpipe in which switching operation is carried out by the hand valve which the end opened for free passage to the compressed-air source of supply, and was arranged in the grip section, Liquid supply tubing which the end opened for free passage to the lubrication liquid stowage and the other end opened for free passage to the vena contracta of an airpipe, the expansion chamber which filled up the upstream with porosity material bordering on the vena contracta which the end opened for free passage to the other end of an airpipe, and was prepared in the interior is formed, and it comes to form the expansion chamber which established the delivery in the downstream -- foam -- a nozzle constitutes.

[0005]

[Function] thus, foam the lubrication liquid drawn according to the venturi tube effectiveness with the compressed air by having constituted -- it sends in in a nozzle, it makes with a precise bubble in the two expansion interior of a room established in this interior, and is made to carry out the regurgitation to the painted surface-ed.

[0006]

[Example] Then, the example illustrated below is explained. the body 1 of a coater which drawing 1 and drawing 2 are what showed one example of this invention, and was shown with the sign 1 in drawing should foam GURRIPU 2 in a point at the end face section -- be constituted as a thing of the gun type equipped with the spreading nozzle 20, and a point should foam the compressed air, the lubrication liquid, i.e., the soapy water, introduced by the GURRIPU side, -- after making it the shape of a precise bubble inside a nozzle 20, it is constituted so that it may apply to a coated object side.

[0007] if this is explained in more detail, the connection of the compressed-air supply pipe 3 and the made aeration pilot hole 4 will establish a lower limit in top \*\* at GURRIPU 2 of the body 1 of a coater

-- having -- this aeration pilot hole 4 -- on the way -- being alike -- the hand valve 5 operated with a finger -- a carp -- it is attached in the condition of having been energized so that the aeration pilot hole 4 might always be blockaded with the RUSUBU ring 6.

[0008] On the other hand, the sign 8 in drawing is the airpipe installed horizontally in the upper part of GURRIPU 2, and the flow control valve 9 is screwed in the leader of this airpipe 8. Here The above-mentioned aeration pilot hole 4 is open for free passage, and the soapy water supply pipe 11 which contained the check valve which is not illustrated is open for free passage to this downstream, and it is constituted so that the soapy water in the soapy water receipt tank 12 can be sucked up in an airpipe 8 according to the venturi tube effectiveness.

[0009] it combined with the airpipe 15 made from vinyl which wound the metal punt 14 ahead [ of GURRIPU 2 ], flexibility was given, and this airpipe 8 was further described above at that tip -- foam -- the nozzle 20 is combined.

[0010] on the other hand -- this -- foam -- the nozzle 20 is making the shell mold so that it may see in drawing, it is attached at the tip of an airpipe 15 through a nozzle 16, and after stirring to homogeneity the soapy water and the compressed air which have been sent in here and making it the shape of a bubble, it is constituted so that the regurgitation may be carried out on the painted surface-ed from the delivery 25 at a tip.

[0011] namely, -- this -- foam -- bordering on the orifice section 21 of that interior, areole 22 are formed in the upstream, Omuro 24 is formed in the downstream, and it fills up with the porosity material 23, such as sponge, in areole 22 further, and a delivery 25 is formed at Omuro's 24 tip, and it is constituted by the nozzle 20 so that the precise soapy water made as it is foamy may be made to breathe out on a coated object side from a delivery 25 within these \*\* 22 and 24.

[0012] thus, in the constituted example, if press actuation of the bulb 5 is carried out with the finger of the direction which grasped GURRIPU 2 that an operator should apply soapy water to the elastic member wearing side of a coated object now, pass the aeration pilot hole 4 of GURRIPU 2 from the compressed-air source of supply 7 -- the compressed air which flowed in the airpipe 8 should foam here, attracting the soapy water in the soapy water receipt tank 12 according to the Ben Cherry effectiveness - it flows down into a nozzle 20.

[0013] And next, if this compressed air and soapy water flow from the narrow nozzle 21 in the size becoming areole 22 of the cross section These cause a turbulent flow within areole 22 by the labyrinth effectiveness, reduce a pressure and a rate rapidly, and flow in the porosity material 23. After being narrowed down furthermore in the orifice section 21, it flows in Omuro 24 with the again big cross section, it mixes to homogeneity, decreasing a pressure and the rate of flow again here, and it becomes a precise foamy fluid, breathes out from a delivery 25, and is applied equally to the elastic member wearing side of a coated object.

[0014]

[Effect of the Invention] As stated above, while connecting a lubrication liquid stowage and liquid supply tubing which was open for free passage to the airpipe of the compressed air in which switching operation is carried out by the hand valve prepared in the grip section according to this invention it comes to divide the expansion chamber which established the delivery for the expansion chamber which filled up the upstream with porosity material at the tip of this airpipe bordering on the vena contracta prepared in the interior in the downstream -- foam -- connect a nozzle and foam, since the coater was constituted A pressure and a rate are first lowered for the compressed air which drew soapy water according to the venturi tube effectiveness in the expansion interior of a room of the upstream, and these are mixed to homogeneity in porosity material. Subsequently After making it the shape of a precise bubble, reducing a pressure and a rate further in the expansion interior of a room of the downstream It can be made to be able to breathe out gently from a delivery and can make applying these to homogeneity in a coated object side as it is possible, and sufficient formation of a low friction surface can be made to perform easily and efficiently by an elastic member's inserting each other in and making necessary minimum lubrication liquid adhere to a part.



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[Translation done.]

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CLAIMS

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[Claim(s)]

[Claim 1] The airpipe in which switching operation is carried out by the hand valve which the end opened for free passage to the compressed-air source of supply, and was arranged in the grip section, Liquid supply tubing which the end opened for free passage to the lubrication liquid stowage and the other end opened for free passage to the vena contracta of the above-mentioned airpipe, the expansion chamber which filled up the upstream with porosity material bordering on the vena contracta which the end opened for free passage to the other end of the above-mentioned airpipe, and was prepared in the interior is formed, and it comes to form the expansion chamber which established the delivery in the downstream -- foam -- a nozzle -- since -- it becomes -- foam -- a coater.

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[Translation done.]